objective
We aim to develop an integrated software suite for covering the entire DBS process including pre- and intraoperative tasks. It allows the rapid integration of new algorithms and techniques to improve the surgical procedure.

Methods
We are implementing a framework using MATLAB, covering the whole process of DBS (Figure 1).

Existing components e.g. for automatic target localisation, determination of an optimal trajectory to the selected target point [1] or automatic fusion of microelectrode recordings (MER) with MRI-volume-data indicating the most likely penetration of the target volume by the electrodes [2] to support intraoperative navigation (Figure 2) are integrated.

All steps are accompanied by a user friendly graphical interface (GUI) including 2D and 3D visualisation capabilities of the individual processing steps.

Results
The creation of an integrated suite allows shorter development cycles and simplifies the prototyping and evaluation of new algorithms. The concept of an easy to use GUI, which builds upon industry standard layout approaches (Figure 3), allows a better participation of medical professionals in early stages of research and development on future techniques.

Conclusion
Integrated solutions can be more tightly followed by medical professionals from the very beginning. Interdisciplinary work is promoted and new perspectives can be established.

References